

CLAIMS

1. In a mobile communication system, a power reduction
5 method for coupling a base station to a mobile unit, the power reduction method comprising the steps of:
detecting consecutive frame erasures (FERs) on a link
coupling the base station to the mobile unit;
determining whether the base station is in a soft
10 handoff condition with the mobile unit; and
when N consecutive frame erasures (FERs) have been
detected, clamping a power of transmission on the link to a
particular level.
- 15 2. In a mobile communication system, the power reduction method as claimed in claim 1, wherein the step of detecting is performed if a frame erasure is detected.
- 20 3. In a mobile communication system, the power reduction method as claimed in claim 1, wherein if a gain ratio of a data frame is different from a previous data frame, the steps of detecting, determining and clamping are performed.
- 25 4. In a mobile communication system, the power reduction method as claimed in claim 3, wherein if the gain ratio of the data frame is different from the previous data frame the steps of detecting, determining and clamping are inhibited from being performed.
- 30 5. In a mobile communication system, the power reduction method as claimed in claim 1, wherein if a frame erasure is not detected, the steps of detecting, determining and clamping are inhibited from being performed.
- 35 6. In a mobile communication system, the power reduction method as claimed in claim 1, wherein if a consecutive frame erasure is detected, there is further included a step of incrementing a consecutive frame erasure counter.

7. In a mobile communication system, the power reduction method as claimed in claim 6, wherein there is further included a step of determining whether the consecutive frame erasure counter is equal to an allowable consecutive frame erasure (N).

8. In a mobile communication system, the power reduction method as claimed in claim 7, wherein if the consecutive frame erasure counter equals the allowable consecutive frame erasure (N), then there is further included steps of:

resetting a consecutive good frames counter;
setting a gain ratio to a clamped gain ratio; and
ignoring by the base station power control bits transmitted by the mobile unit.

9. In a mobile communication system, the power reduction method as claimed in claim 8, wherein there is further included a step of when M consecutive good frames have been detected, unclamping the power of the transmission on the link.

10. In a mobile communication system, the power reduction method as claimed in claim 9, wherein there is further included a step of determining whether the base station is in the soft handoff condition with the mobile unit.

11. In a mobile communication system, the power reduction method as claimed in claim 10, wherein if the base station is in the soft handoff condition there is further included the step of determining whether a gain ratio of a data frame corresponds to a previous data frame.

12. In a mobile communication system, the power reduction method as claimed in claim 11, wherein if the gain ratio of the data frame corresponds to the previous data frame there is further included a step of determining whether a good data frame was received.

13. In a mobile communication system, the power reduction method as claimed in claim 12, wherein if a good frame was detected there is further included a step of counting by the
5 base station a number of consecutive frames received.

14. In a mobile communication system, the power reduction method as claimed in claim 13, wherein there is further included a step of determining whether a number of the
10 consecutive good frames counter is equal to an allowable consecutive good frames (M).

15. In a mobile communication system, the power reduction method as claimed in claim 14, wherein if the number of
15 consecutive good frames does equal M there is further included the steps of:

resetting the consecutive frame erasures counter;
setting the gain ratio to an unclamped gain ratio; and
responding by the base station to power control bits
20 from the mobile unit.

16. In a mobile communication system, a power reduction method for controlling power transmitted by a base station of a plurality of base stations to a mobile unit, the power reduction method comprising the steps of:

- 5 counting by the base station a number of consecutive frame erasures;
- determining whether the number of consecutive frame erasures is equal to an allowable consecutive frame erasures (N); and
- 10 if the number of consecutive frame erasures is equal to N, entering by the base station a recovery state.

17. In a mobile communication system, the power reduction method as claimed in claim 16, wherein if a data frame is a first data frame in the recovery state, there is further included a step of setting a gain ratio to a nominal value.

18. In a mobile communication system, the power reduction method as claimed in claim 17, wherein if the data frame is not the first data frame in the recovery state there is further included a step of determining whether the gain ratio is less than a maximum value.

19. In a mobile communication system, the power reduction method as claimed in claim 18, wherein if the gain ratio is not less than maximum value there is further included a step of setting the gain ratio to one step less than the maximum value.

20. In a mobile communication system, the power reduction method as claimed in claim 18, wherein if the gain ratio is less than the maximum value there is further included steps of:

- increasing the gain ratio by one step size; and
- 35 maintaining the gain ratio at less than the maximum value.

21. In a mobile communication system, the power reduction method as claimed in claim 18, wherein there is further included a step of determining whether the data frame is a good data frame.

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22. In a mobile communication system, the power reduction method as claimed in claim 21, wherein if the data frame is a good data frame, there is further included a step of incrementing a count of consecutive good frames.

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23. In a mobile communication system, the power reduction method as claimed in claim 22, wherein if the data frame is not a good data frame there is further included a step of resetting the count of the consecutive good frames.

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24. In a mobile communication system, the power reduction method as claimed in claim 23, wherein there is further included a step of determining whether the count of the consecutive good frames is equal to a required number of consecutive good frames (M).

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25. In a mobile communication system, the power reduction method as claimed in claim 24, wherein if the count of the consecutive good frames is equal to M, there is further included the steps of:

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setting the recovery state of the base station to a normal state; and

resetting the number of consecutive frame erasures.

26. A power reduction method for a mobile communication system for controlling power transmitted by a base station to a mobile unit, the power reduction method comprising the steps of:

- 5 clamping by the base station a power of transmission of a link between the mobile unit and the base station when N consecutive frame erasures have been detected; and
- unclamping by the base station the power of transmission of the link between the mobile unit and the base
- 10 station when M consecutive good frames have been transmitted to the mobile unit.

27. A power reduction method for a mobile communication system for controlling power transmitted by a base station via a link to a mobile unit, the power reduction method comprising the steps of:

5 detecting by the base station a weak link to the mobile unit; and

when the weak link is detected, setting by the base station a transmit power level to a reduced transmit power level.

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28. The power reduction method as claimed in claim 27, wherein there is further included a step of maintaining the reduced transmit power level until the link is no longer the weak link.

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29. The power reduction method as claimed in claim 28, wherein there is further included a step of determining that the link is no longer the weak link by a frame erasure rate associated with the weak link.

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30. The power reduction method as claimed in claim 29, wherein the step of determining includes a step of detecting M consecutive good frame on the weak link.

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31. The power reduction method as claimed in claim 27, wherein the step of detecting includes a step of determining that the link is the weak link by a frame erasure rate associated with the link.

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32. The power reduction method as claimed in claim 31, wherein the step of determining that the link is the weak link includes a step of detecting N consecutive frame erasures on the link.

33. A power reduction recovery method for a mobile communication system for controlling power transmitted by a base station via a plurality of links to maintain a call with
5 a mobile unit, the power reduction recovery method comprising the steps of:

detecting by the base station that each of the plurality of links to the mobile unit is clamped;
10 when each of the plurality of link is clamped, increasing the power transmitted on each of the plurality of links; and
if the call with the mobile unit is maintained, inhibiting an increase of power transmitted on each of the
15 plurality of links.

34. The power reduction recovery method as claimed in claim 33, wherein the step of detecting includes a step of determining whether each of the plurality of links is clamped
20 by a frame erasure rate associated with each of the plurality of links.

35. The power reduction recovery method as claimed in claim 34, wherein the step of determining whether each of the plurality of links is clamped includes a step of detecting M
25 consecutive frame erasures on each of the plurality of links.

36. The power reduction recovery method as claimed in claim 33, wherein the step of if the call with the mobile unit is
30 maintained, inhibiting an increase of power includes a step of determining from a frame erasure rate that the call has been maintained.

37. The power reduction recovery method as claimed in claim 36, wherein the step of determining from a frame erasure rate
35 that the call has been maintained includes a step of detecting that N consecutive non-frame erasures are received by at least one link of the plurality of links.